

A NEW SPECIES OF
CONRADINA (LAMIACEAE) FROM
NORTHEASTERN PENINSULAR FLORIDA

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ABSTRACT

Conradina etonia, a new species of shrubby mint endemic to northern peninsular Florida is diagnosed, described, and figured. Differences between it and its closest morphological relative, *C. grandiflora* Small, are detailed. Attention is given to the fact that *C. etonia* is a narrow endemic, that it is on land being developed presently for residential use, and that it therefore should receive a high conservation priority.

Conradina (Lamiaceae) as currently treated (Shinners 1962; T. C. Gray, unpublished Ph.D. thesis 1965) is a genus of five allopatric species bicentrically confined to the southeastern United States. One center is interior, where the arenaceous rocky bars and bluffs of Cumberland Kentucky and Tennessee streams support *C. verticillata* Jennison, a threatened species. The other center is lower Coastal Plain. *Conradina canescens*, the most abundant and polymorphic species, occupies coastal dunes, white sand scrub and contiguous longleaf pineland from southeastern Mississippi eastward across southern Alabama and the Florida Panhandle. Inland locally is the rare *C. glabra* Shinners, a narrow endemic growing chiefly around the rims of steepheads on the east side of Florida's Apalachicola River. The two remaining species (*C. brevifolia* Shinners and *C. grandiflora* Small) are found in sand scrub habitat in Central Florida (Polk and Highlands counties) and in eastern peninsular Florida, respectively. As mentioned, of the four species in the southern center, only *C. canescens* is at once abundant within a fairly large range and exhibits considerable variation. The other three have more restricted ranges and show less variation within or between popula-

tions. Most circumstantial evidence, both morphological and geographic, points to a relatively recent origin for the species in peninsular Florida.

All four Coastal Plain *Conradina* are confined to sandy soils. Major portions of Florida with deep, well-drained sand once supported extensive forests of Longleaf Pine (*Pinus palustris*) with a ground layer dominated by Wiregrass (*Aristida stricta*). This system was maintained by and dependent upon relatively frequent, low-intensity ground fires. The more xeric Longleaf Pine-Wiregrass ecosystems are here referred to as "sandhill." These contrast with those finer textured (often aeolean) deposits of white sand which support the scrub ecosystem characterized by Sand Pine (*P. clausa*) and shrubby evergreen oaks such as *Quercus geminata* and *Q. myrtifolia* and are referred to here as "sandscrub." Historically this latter system burned infrequently but catastrophically. All who have studied the flora of the two basic systems know that both are very rich in endemics and that many species occupy very limited and circumscribed ranges within them. Scrub ecosystems, once exclusive to Florida or best developed there, have been so heavily impacted by agricultural and other development along with fire suppression that only fragmentary, often degraded, remnants exist today. Conservation agencies are actively working to preserve key areas, particularly in the Lake Wales Ridge area of Central Florida where an unusual concentration of rare endemics occurs.

The typical scrub habitat and several of the plant and animal species associated with it reach their northern geographic limits in the center of the Florida peninsula west of Saint Augustine. One such northern extension of deep sand scrub was investigated by the junior author on September 20, 1990. This area along Etonia Creek northeast of Florahome in Putnam County, was noted to have several species not only characteristic of south Florida scrub but also at or near their very northern limits (i.e. *Persea humilis*, *Ilex cimulicola*, *Garberia fruticosa*). An endangered bird, the Scrub Jay, was also seen, but curiously the Scrub Palmetto (*Sabal etonia* Swingle ex Nash), named for this locality, was not observed.

Most interesting of all, however, was the discovery within a small area of the Etonia Scrub of a distinctive *Conradina*, seemingly a new species. A limited amount of material for exsiccatae and for propagation was collected and living plants from cuttings are now part of the comprehensive collection of southeastern woody Lamiaceae in cultivation at Woodlanders, Inc., in Aiken, South Carolina. Dr. R. K. Godfrey was given directions to the site and, accompanied by Mr. Angus Gholson, visited the location on 12 October 1990, so as to collect an abundant sample for definitive study. This indispensable aid is hereby gratefully acknowledged.

The affinities of this new plant are plainly with its nearest geographic

neighbor in the genus, *C. grandiflora* Small, which ranges intermittently in the coastal scrub of eastern peninsular Florida from Dade County northward to an area in Volusia County roughly 70 air miles southeast of the Etonia Creek site. In general habit and in the large size and general configuration and pigmentation of flower the two look much the same. There are, however, striking differences as will be explained below. We name the new discovery *C. etonia*, after the remarkable locality where it was found.

CONRADINA ETONIA Kral & McCartney, sp. nov. Figs. 1, 2.

Conradina etonia, sp. nov.; differt a *C. grandiflora* foliis latioribus, hebetiviridibus, nervis lateralibus distinguibilibus, utroque latere 2-4; paginisurculorum juvenorum, laminarum foliorum et tuborum calicorum uniformiter patienti-puberulis.

Virgate shrubs to 1.5 m high, with numerous, frequently arching primary branches, the new shoots slender, ca. 1 mm thick, quadrate, downy-spreading-puberulent, scattered-glandular, reddish-brown, on older growth thickening, terete, the outer bark exfoliating in long, narrow, gray strips, exposing red-brown or orange-brown smooth inner bark. Leaves deciduous in 2-3 years, spreading to ascending, each node with axillary buds typically developing short, leafy shoots, thus foliage appearing fascicled-verticillate; principal leaf blades spreading to spreading-ascending, broadly to narrowly oblanceolate or spatulate, 15-30 mm long, (2) 3-9 mm wide, tips rounded to broadly acute, margins narrowly and tightly revolute, base narrowly cuneate to attenuate on a short (less than 1 mm) petiole, the adaxial blade surface uniformly downy-spreading-puberulent, copiously and punctately gland-dotted, dull green, the midrib evident at base of a strong median groove, the exposed abaxial surface concave, slightly paler, the puberulence very dense, the midrib strongly raised, likewise with dense spreading puberulence and producing 2-4 strong branch nerves per side (a unique trait in this genus!). Cymes produced from all or most nodes from midstem up, (1) 3-7 (12) flowered, either sessile or on spreading-ascending peduncles to 2 (3) mm long, these and the ascending branches all densely and uniformly downy-puberulent, their successive nodes with progressively reduced, narrower, decussately-arranged pairs of similarly downy bracteate leaves; pedicels erect or spreading-ascending, 1-3 mm long, ebracteolate, spreading-puberulent. Calyx at anthesis bilabiate, 7.5-8.1 mm long, the tube cylindro-campanulate, 5 mm long, distally densely villous-annulate within, otherwise smooth, externally 13-nerved, with nerves uniformly downy and intervals smooth to downy, strongly gland-dotted, the upper lip upswept (1.8) 2-2.7 (3) mm long, tridentate, the teeth broadly triangular, strongly hirsute-ciliate, connivent; lower lip directed forward

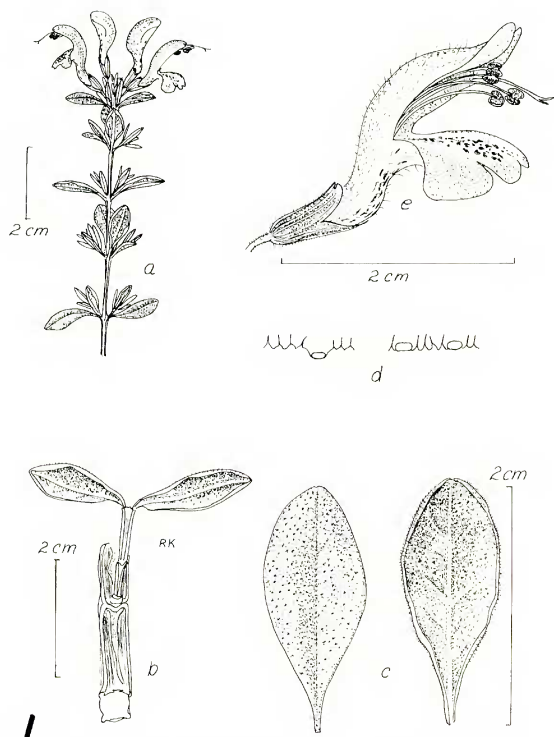


FIG. 1. *Conradina etonia* (Godfrey with Gbolson 84008). — a. Flowering branchlet. — b. Sector of old shoot with branchlet base. — c. Adaxial (left hand) and abaxial (right hand) views of stem leaf. — d. Small sector, ideal cross-section, adaxial surface of leaf (left) and that of abaxial surface (right). — e. Side view of flower at anthesis.

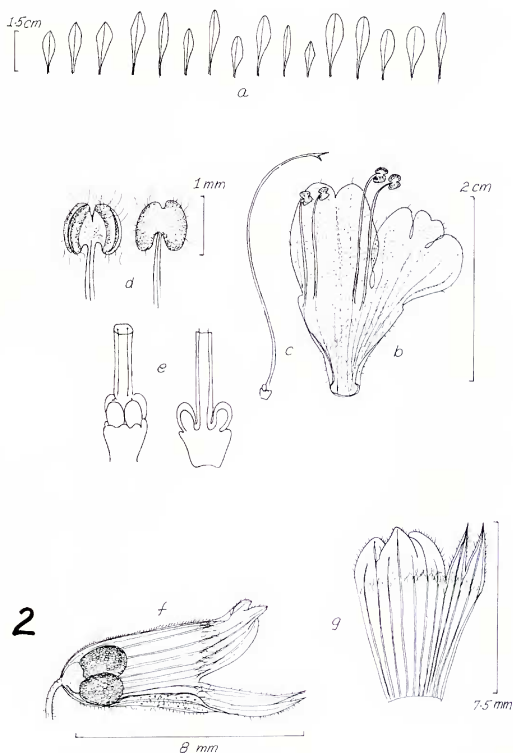


FIG. 2. *Conradina etonia* (Godfrey with Gbolson 84008). — a. A range of principal shoot leaf types and sizes drawn to scale. — b. Opened corolla (with small portion of tube removed) to show inner surface, stamens. — c. Gynoecium, side view. — d. Adaxial (left) and abaxial (right) view of anthers. — e. Gynoecial base, ideal view, showing placement of nutlets on gynophore (left) and a median longisection showing placentation (right). — f. Calyx, opened to show fruit placement, annulus. — g. Opened calyx to show arrangement of calyx teeth.

and upcurved, 2.5–3.1 mm long, cleft to near base, the teeth narrowly triangular-subulate, likewise variably hirsute-ciliate with hairs under 1 mm. Corolla strongly bilabiate, 20–25 mm long to tip of lower lip, the slender tube gradually broadened to a geniculation at throat base ca. 2 mm above calyx sinus, funnellform to level of limb, from base to limb densely villose within; upper lip galeate, broadly oblong, 10–11 mm long, the keel continuous with the upper side of throat, projected outward and forward as a strong arch, apically emarginate; lower corolla lip bent abruptly down, slightly longer, trilobed, the laterals ascending-oblong, producing an ascending, oblong-rounded extension, the central lobe shortest, obcordate; corolla tube and throat adaxially lavender-blue to lavender-rose, the upper lip uniformly lavender, the lower lip and throat medially with a broad longitudinal zone of white or cream mottled with spots and streaks of deep purple, the bordering lobes and edges again uniformly lavender, all edges intermittently pilose-ciliate, the external surfaces with a mixture of downy and villous hairs and gland-dotted. Stamens tetradynamous, both pairs roughly paralleling the upper lip and directly under its keel, the shorter pair extending ca. to its tip, the longer slightly beyond, arching outward and downward, the anthers slightly divergent on broad connective, ca. 1 mm long, broadest across the base, the thecae dark purple, white-villous-pilose along the dehiscence line. Style sigmoid, its bifid-stigmatose tip exserted slightly beyond level of anthers. Nutlets mostly 4, obovoid, 1–1.2 mm long, brown, very finely reticulate toward apex.

TYPE: U.S.A. FLORIDA. PUTNAM CO.: Sand Pine Scrub, undeveloped subdivision, SE on Fla. rd 100, 2 mi from Florahome thence to left on Holladay Rd. 1.9 mi to Blossom Rd. on right, thence to intersection Blossom and Garden St., 20 Sep 1990, *Robert B. McCartney, s.n.* (HOLOTYPE: SMU; ISOTYPE: VCB).

Additional specimens examined: TOPOTYPES: 12 Oct 1990, *R.K. Godfrey* with *Angus Gibolson* 84008 (BH, F, FLAS, FSU, GA, GH, K, NCU, NY, PH, RSA, TENN, TEX, UC, USC, US, VDB, VSC, WAT, WILLI).

The habitat in detail is a deep white-sand scrub dominated by *Pinus clausa*, *Quercus chapmanii*, *Q. geminata*, *Q. myrtifolia*, with some *Q. laevis* and a mixed understory of *Serenoa repens*, *Smilax*, *Persea humilis*, *Asimina*, *Ceratiola*, *Sageretia minutiflora*, *Ilex cumulicola*, *Licania*, *Rubus cuneifolius*, *Garberia*, and herbs such as *Eupatorium compositifolium*, *Liatris chapmanii*, *Balduina angustifolia*, *Carpobethorus corymbosus*, *Chrysopsis scabrella*, *Palafoxia integrifolia*, *Elephantopus*, *Polygonella*. The *Conradina* are most abundant in sandy natural or artificial clearings, less so in the scrub itself; it would appear, therefore, that this mint responds abundantly to disturbance (historically this probably fire) as do many of the other shrubs and herbs of this habitat type.

Those who work with *Conradina* will agree that *C. etonia* as described here shares more character states with *C. grandiflora* than it does with any other *Conradina*, that it shares similar habitat, and that it is closest geographically to that species. Thus the burden of proof is in establishing the most apparent differences in character between the two:

1. Indumentum of young shoots of *C. etonia* is puberulent, the hairs thus minute, spreading, downy; that of *C. grandiflora*, likewise minute and abundant, is mostly upcurved. That of inflorescence branches in both is also abundant and minute, but that of the former is again spreading, more uniform, while in the latter it may be admixed with some pilosity.

2. Leaves of the two differ strongly, those of *C. etonia* being distinctly broader with lateral veins quite evident on the undersurface, a feature held by no other known species of *Conradina*; both adaxial and abaxial surfaces are dull green, each with a uniform spreading-and-downy puberulence (the texture of this adaxial side much like that of the undersurface of Chalk Maple leaves!), that of the adaxial surface slightly less than that of the paler, abaxial side. In *C. grandiflora* the adaxial side of the leaf is dark green, lustrous, with a minute, incurved, harder pubescence, that of the abaxial side is whitened by a dense mat of white, short, appressed tomentulum and shows no branching from the usually sparsely strigillose midrib.

3. Dimensions, shapes, and pollination guide markings in flowers of both species overlap very much, with calices extremely similar in size-range, but those of *C. etonia* (again) with puberulence denser and more uniform (downy), very rarely with the tube having any pilosity and this confined to a few "whiskers" at or toward its base; in *C. grandiflora* most specimens show a very strongly gradate pubescence of calyx tube, from some long pilosity over 1 mm to an admix of shorter pilosity, some gland-tipped, and puberulence. Calyx teeth in both are hirsute-ciliate, but such hairs in *C. etonia* are shorter, more uniform. Corollas of these species are hardly distinguishable.

4. Stamens of the two species are again very similar as to size and shape, but while anthers of *C. etonia* are bedecked with a distinctive long fringe of white pilose-villous hairs, those of *C. grandiflora* have fewer and shorter hairs, these tending to be concentrated more at anther sac tips and bases.

The features detailed above convince us that *C. etonia* could well be the best-marked species in a genus whose species differ mostly in very fine characters.

We are hopeful that further exploration of the northern lobes of Florida scrub habitat will yield more records for this beautiful new species. Indeed, it may show us some intermediates. A clue to this is a Volusia County collection of *C. grandiflora* (Sand Pine sandridge by I-95, 0.6 mi S Port

Orange exit, 28 Aug 1974, *Kral 54022*) in which new shoots have an atypical spreading downiness similar to that in our new species. But even this material in no other way resembles *C. etonia*.

Because *Conradina etonia* is rare and perhaps restricted to a small area of highly vulnerable habitat, we have attempted to expedite the publication of its description and initiate appropriate protection strategies. The known range is within a subdivided tract with streets roughed-in and a few residences built. Botanists, the general public, and affected property owners will hopefully refrain from actions which might further jeopardize the survival of this species and will support efforts to conserve it.

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